

WHY SHOULD HUMANS EXPLORE A NEAR EARTH ASTEROID AND WHAT FACTORS DRIVE THE MEDICAL RISKS?

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The National Aeronautics and Space Administration (NASA) is currently considering plans for the human exploration of a Near Earth Asteroid (NEA). Reasons for undertaking the human exploration of a NEA include increasing the scientific understanding of the origins of our solar system, and developing technology for the exploration of more distant destinations such as Mars. Most mission scenarios have a duration on the order of several months or a year, most of which is spent in transit to and from the NEA. The choice of a particular NEA destination determines the mission duration and guides the types of exploration activities that can be performed on and near the NEA. NASA's Human Research Program (HRP) has identified short and long-term health risks associated with such missions and begun characterizing the level of risk. Some risk drivers are well known from missions to low Earth orbit and the Moon (e.g., the limited mass, volume, and power available for the medical care system). Other factors emerge as major drivers for NEA missions. Some are fundamental characteristics of the mission parameters (e.g., mission duration, distance) and others are strongly dependent on the specifics of how the mission is implemented (e.g., isolation and confinement). Careful consideration of these factors will be required for safe and effective missions to NEAs.